

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



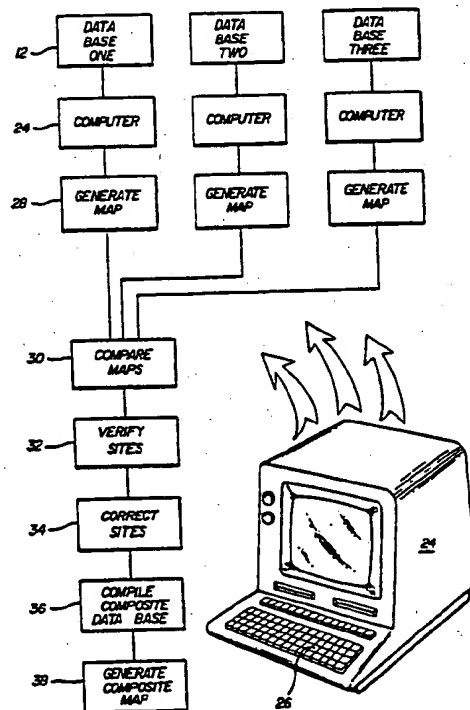
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : G06F 3/00, G06K 9/36	A1	(11) International Publication Number: WO 90/14627 (43) International Publication Date: 29 November 1990 (29.11.90)
<p>(21) International Application Number: PCT/US90/02880</p> <p>(22) International Filing Date: 14 May 1990 (14.05.90)</p> <p>(30) Priority data: 351,956 15 May 1989 (15.05.89) US</p> <p>(71)(72) Applicant and Inventor: BENNETT, Mark, J. [US/US]; 28330 Franklin River Drive, Apt. 205, Southfield, MI 48034 (US).</p> <p>(74) Agents: KRASS, Allen, M. et al.; Krass & Young, 3001 W. Big Beaver, Ste 624, Troy, MI 48064 (US).</p> <p>(81) Designated States: AT (European patent), AU, BE (Euro- pean patent), BR, CA, CH (European patent), DE (Euro- pean patent)*, DK (European patent), ES (European pa- tent), FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (Euro- pean patent), SE (European patent), SU.</p>	<p>Published With international search report. With amended claims.</p>	

(54) Title: METHOD FOR GENERATING MAPS

(57) Abstract

A method for generating a composite map (38) of geographic locations from a plurality of data bases (12) is disclosed. Each data base (12) includes a set of geographic coordinate data using various geocoding systems. The method comprises the steps of inputting the coordinate data into a computer (24), generating a map corresponding to each data base (28) and comparing and correcting (30) each of the generated maps. The method further includes the steps of preparing a composite data base (36) of all the corrected data (34) and generating a composite map (38).



METHOD FOR GENERATING MAPS

Background of the Invention

Field of the Invention

The present invention relates generally to
5 cartography or map-making, and more particularly, to a
method for generating a composite map from information
contained in a plurality of data bases identifying a
plurality of locations by various geographical coordinate
data. Specifically, the invention provides a method for
10 generating a composite map corresponding to existing and
potential environmentally hazardous locations impacting
a parcel of real estate.

Description of the Related Art

Environmental contamination of a real estate
15 often results in the diminution of its economic value.
Investigating the environmental integrity of the property
is therefore crucial in the purchasing decision.
Traditional methods of investigating the condition of
real estate include questionnaires, title reports,
20 surveys and appraisals. However, the inaccessibility of
information relating to environmental contamination of
property makes the investigation difficult.

Federal, state and local government agencies
compile information regarding known and potential
25 environmentally hazardous sites. Environmentally
hazardous sites include real estate property subject to

Summary of the Invention

The present invention provides a method for generating a composite map of geographic locations from a plurality of data bases. Each one of the plurality of data bases identifies a set of geographic sites. Each site in each set is described by geographic coordinate data using various geocoding systems. The sites within a single set may also be recorded in different geocoding systems.

10 The claimed method comprises the steps of inputting the coordinate data of each set of geographic sites into a computer also provided with an application program for generating the map itself, and generating a plurality of maps, each map corresponding to one of the 15 plurality of data bases. Each generated map graphically shows the location of each geographic site within the corresponding data base.

 The method further includes the steps of comparing each of the generated maps with the others of 20 the generated maps for consistency of geographic characteristics of the location of each geographic site and correcting any inconsistent coordinate data. By consistency is meant accuracy in site location as well as uniformity between data bases in describing each site in 25 the same geocoding system.

 The method also includes the steps of compiling a composite data base including all the corrected geographic coordinate data for each set of geographic

Brief Description of the Drawings

FIGURE 1 is a schematic flow diagram of the map generating method of the present invention;

FIGURE 2 is a computer generated map of a specific area having geographic sites subject to environmental contamination plotted from geographic coordinate data contained in the Federal Superfund data base;

FIGURE 3 is a computer generated map of 10 geographic sites for the same area as Figure 2 plotted from geographic coordinate data from the Michigan Sites of Environmental Contamination data base;

FIGURE 4 is a computer generated map of geographic sites for the same area as Figures 2 and 3 15 plotted from geographic coordinate data contained in the Oakland County, Michigan, Listing of Environmental Contamination data base; and

FIGURE 5 is a composite computer generated map of the area of Figures 2-4 showing all the sites subject 20 to environmental contamination generated by one embodiment of the method of the present invention.

Detailed Description of the Preferred Embodiment

Referring now to the drawing, Figure 1 is a schematic flow diagram of the map generating method of 25 the present invention. The method generates a composite map of geographic locations from a plurality of data bases, generally indicated at 12, portions of which are

Table 2 lists locations subject to environmental contamination for the exact same area in the corresponding state data base.

Table 2: State Sites of Environmental Contamination

<u>5 Map Reference</u>	<u>Site Name</u>	<u>Location/Address</u>
14	Acme Dump	1500 Lake Ridge Rd.
18	Jones Disposal Co.	SW 1/4 NE 1/4 Sec.20
20	John's Gas Station	12778 Apple Rd.

Table 3 lists the corresponding county listing 10 of geographic locations subject to environmental contamination for the identical area.

Table 3: County Listing of Sites of Environmental Contamination

<u>Map Reference</u>	<u>Site Name</u>	<u>Location/Address</u>
15 14	Acme Dump	1500 Lake Ridge Rd.
22	Hillman Landfill	23333 Boyer Ridge Rd.

As can be seen from the geographic sites identified in each of the above tables, discrepancies exist between locations/addresses as well as the 20 geocodings systems used to describe the sites. Also, the different data bases include different sites even though each data base is meant to include all sites subject to environmental contamination for the same specific area. For example, the state data base of sites of 25 environmental contamination list three geographical sites whereas the federal and county data bases list two sites.

After all of the sets of geographic coordinate data from a data base 12 has been inputted into the microprocessor, the geographic information systems program generates a map of the locations corresponding to each site within that data base. The present method also contemplates manually plotting the geographic sites. Figures 2, 3 and 4 are examples of maps generated by the geographic information systems software for the federal, state and county data bases described above. Map references 14-22 described above have been plotted for an area of Troy, Michigan. Obviously, this area has been chosen as an example only, and is not meant as a limitation upon the present invention. The present invention can be utilized to plot coordinate data for other areas as well. Figure 2 is a map of the sites recorded in Federal Superfund database. Figure 3 is a map of the state sites of contamination and Figure 4 is a map of the county listing of sites of environmental contamination.

As shown, the Acme Dump site 14 is plotted on all three database maps, 2, 3 and 4. However, there is a discrepancy between the site address as plotted on Figure 2 and that which is plotted on Figures 3 and 4. Figure 2 locates the site at 3000 Lake Ridge Road while Figures 3 and 4 plot the location address at 1500 Lake Ridge Road. This is a common example of inconsistent and inaccurate geographic coordinate data between one or more data bases. Site 16, Smith Tool and Die, is plotted on

generated maps for consistency in plotting the coordinate data. The comparison 30 may be done visually or by a mechanical comparator which compares significant points on one two-dimensional coordinate plot to significant 5 points on another. Also, the initial computer generated maps of Figures 2, 3 and 4 may be plotted on transparent plastic overlays so that one map may be placed directly over another to permit easy visual comparison of locations.

10 Verifying the geographic coordinate data in the plurality of data bases is the next step in the method of the present invention. Verification may be done by physically visiting the site or location or by telephoning the site to request a proper address.

15 After the verification has been completed, the next step is to correct 34 the inconsistent locations/addresses in the data bases. Correction 34 can be done manually and also includes identifying omissions between data bases 12 and rectifying them by supplying 20 proper geocoding to enable accurate plotting of the sites into the geographic information system.

 The next step in the method is to compile 36 a composite data base including all of the corrected and verified geographic coordinate data for each set of 25 geographic sites from each data base 12. This can be done by inputting the composite information into the computer 24 through the use of the computer keyboard 26 or through magnetic tape as described above. Table 4

Claims

1. A method for generating a composite map of geographic locations from a plurality of data bases, each of said plurality of data bases including a set of 5 geographic sites recorded therein by means of geographic coordinate data using various geocoding systems, said method comprising the steps of:

inputting the coordinate data of each set of geographic sites into a computer having an application 10 program for generation of maps;

generating a map of geographic locations each having geographical characteristics from the coordinate data of each of said sets of geographic sites, said generated map corresponding to one of the plurality of 15 data bases;

comparing each of said generated maps with the others of said generated maps for consistency of geographic characteristics of the geographical locations thereon;

20 correcting any inconsistent geographic characteristics;

compiling a composite data base of geographic sites including geographic coordinate data corresponding to the correct geographical characteristics for each 25 geographic site; and

inputting said geographic coordinate data from said composite data base into said computer to generate

compiling a composite data base including correct geographic coordinate data corresponding to the correct geographical characteristics for each geographic site; and

5 inputting said composite data base into said computer to generate a composite map including geographic locations corresponding to the correct coordinate data for each geographic site.

4. The method as in claim 3, further including
10 the step of verifying the geographic coordinate data of each of said sets of sites.

2. The method as in claim 1, further including the step of verifying the geographic coordinate data of each of said sets of sites.

3. A method for generating a composite map identifying environmentally hazardous geographic locations, said method comprising the steps of:

inputting into a computer having a program for generation of maps, geographic coordinate data from a plurality of data bases, each of said plurality of data bases identifying a set of geographic characteristics by various geocoding systems;

generating a plurality of maps, each of said maps based on information contained in a corresponding one of said data bases;

comparing each of said generated maps with the others of said generated maps for consistency of geographic characteristics of the geographic locations thereon;

identifying any inconsistency of geographic characteristics of the geographical location between said maps from said comparing step;

correcting an inconsistent geographic characteristics;

compiling a composite data base including geographic coordinate data corresponding to the corrected geographical characteristics for each geographic site; and

inputting said composite data base into said computer to generate a composite map including geographic

composite map including geographic locations corresponding to the corrected coordinate data for each geographic site.

6. A method for generating a composite map identifying environmentally hazardous geographic locations, said method comprising the steps of:

inputting into a computer having a program for generation of maps, geographic coordinate data from a plurality of data bases, each of said plurality of data bases identifying a set of geographic characteristics by various geocoding systems;

generating a map from said plurality of data bases and having geographic locations having geographic characteristics thereon corresponding to each of said sites identified by the plurality of data bases with various geocoding systems;

comparing the information from the plurality of data bases of said map for consistency of geographic characteristics of the geographic locations thereon;

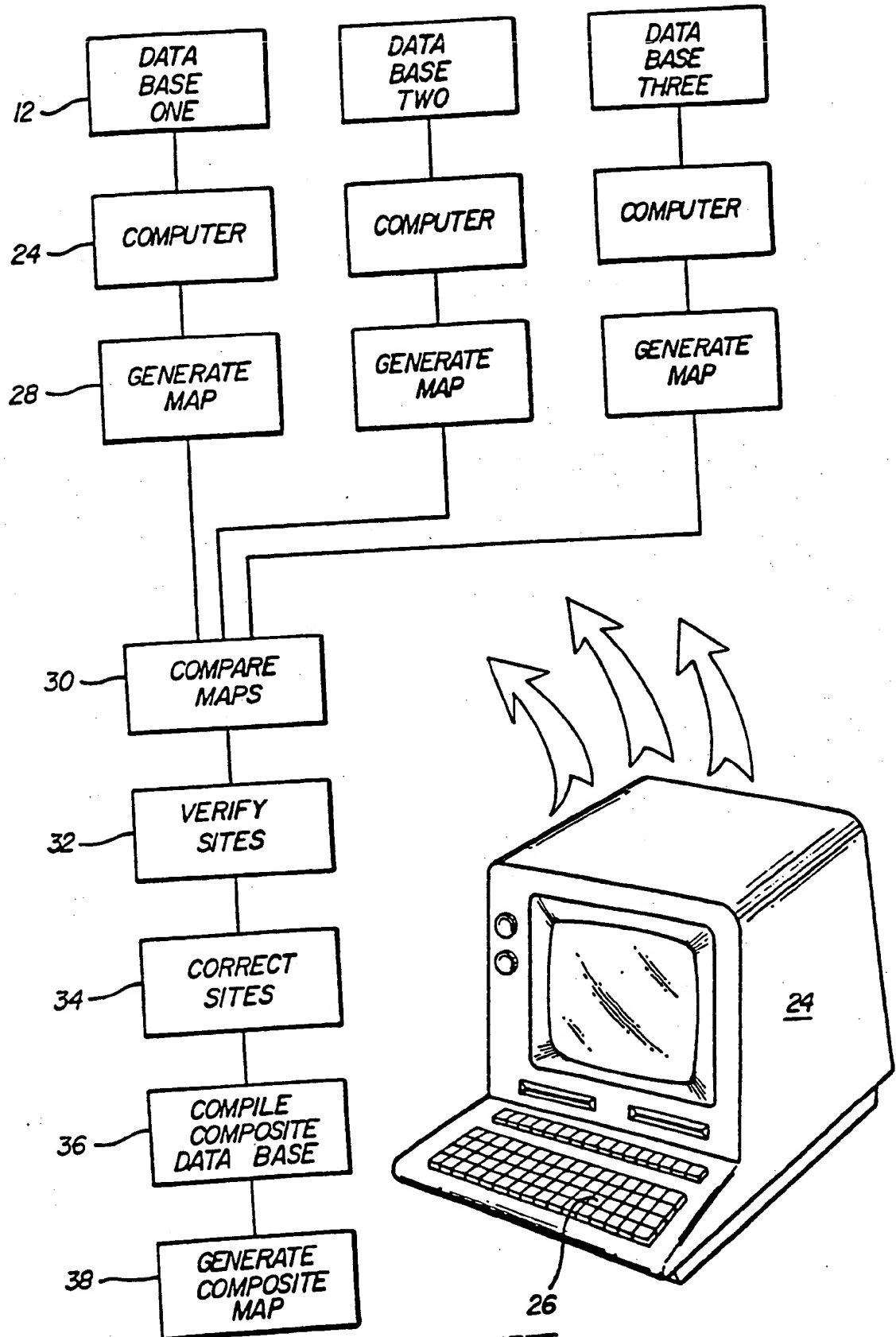
identifying any inconsistency of geographic characteristics of the geographical location on said map from said comparing step;

correcting any inconsistent geographic characteristics;

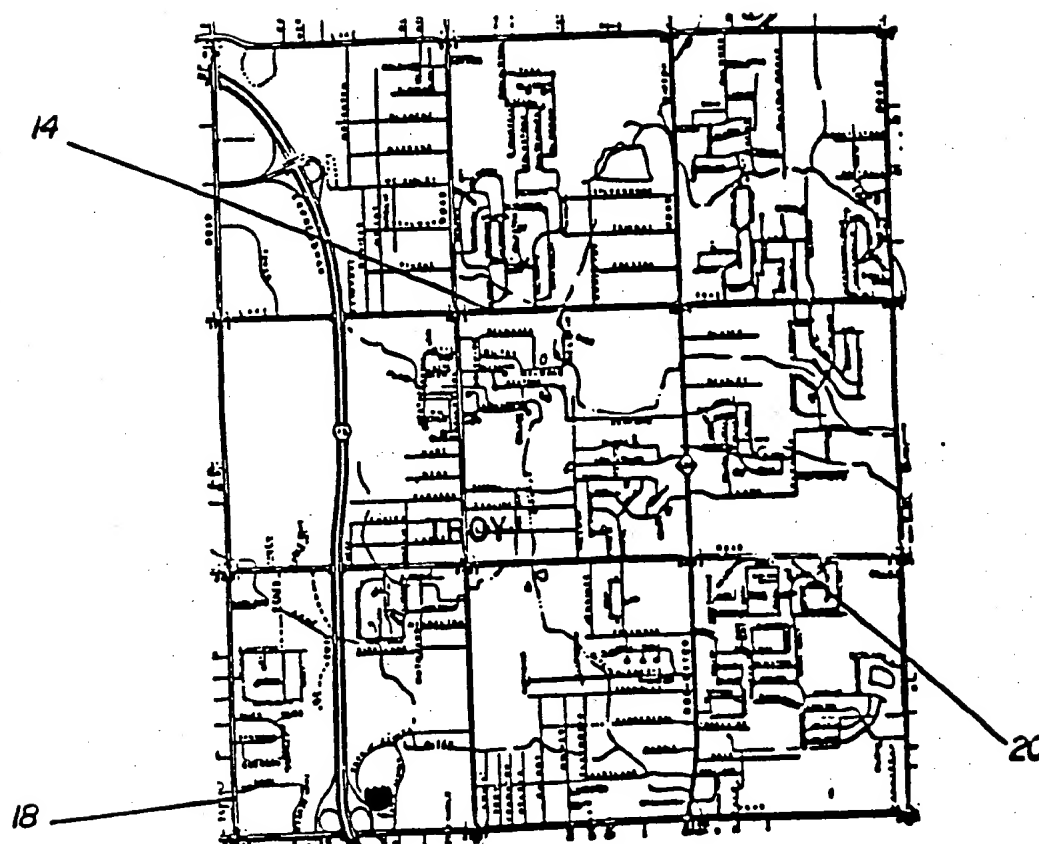
compiling a composite data base including correct geographic coordinate data corresponding to the corrected geographical characteristics for each geographic site; and

inputting said composite data base into said computer to generate a composite map including geographic

- 1 / 5 -

FIG. 1

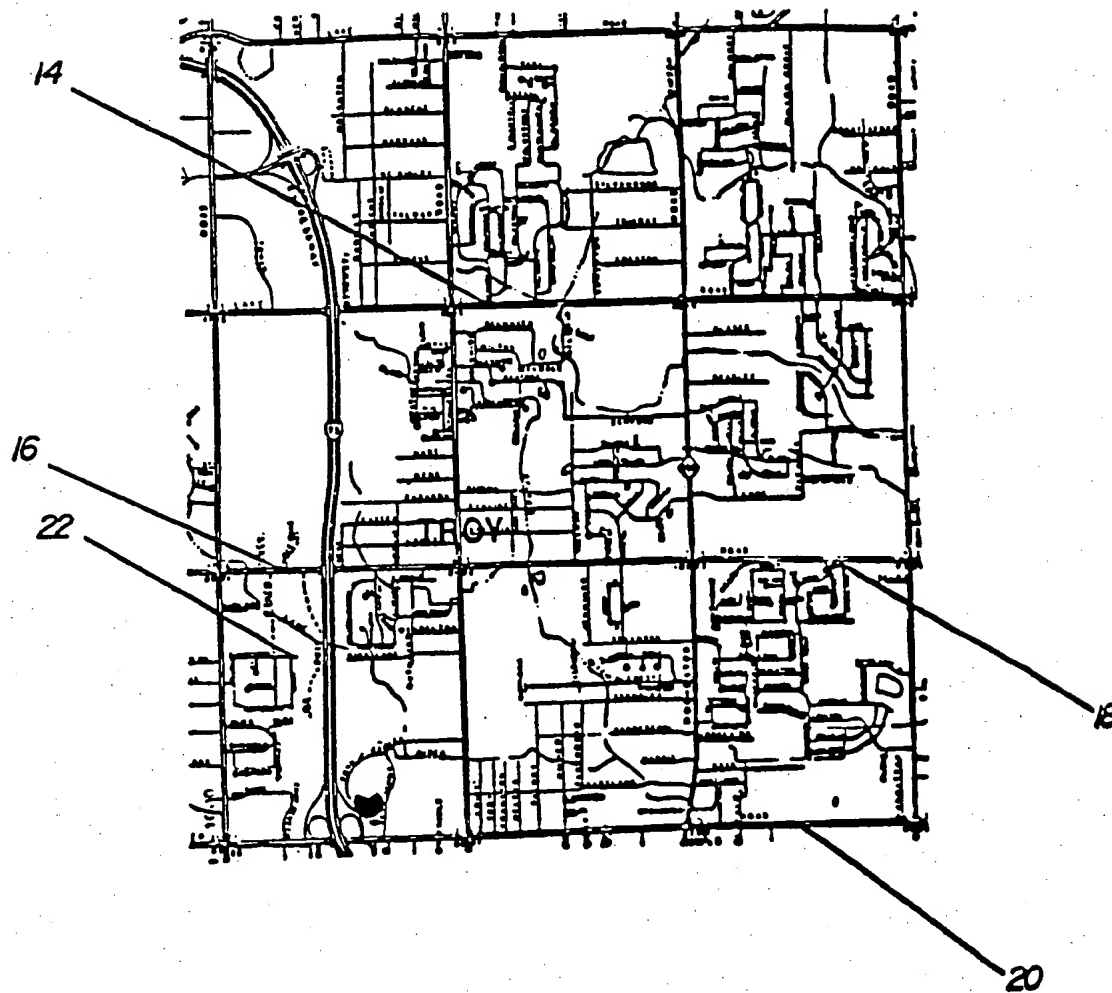
- 3 / 5 -

FIG. 3

STATE SITES OF ENVIRONMENTAL CONTAMINATION
(INITIAL COMPUTER GENERATED MAP)

SUBSTITUTE SHEET

- 5 / 5 -

FIG. 5

FINAL COMPOSITE COMPUTER GENERATED MAP

SUBSTITUTE SHEET